REMARKS

By this amendment, applicant has amended independent claims 1 and 12 to include therein the limitation previously recited in dependent claim 5. Applicant has canceled claims 5, 6 and 9 without prejudice or disclaimer and has amended claims 15 - 23 to correct a typographical error. Applicant has also added claims 28 - 37 to further define the present invention. See, e.g., page 5, lines 9 - 11 of applicant's specification. Applicant has amended Figure 2 to show elements 2b and 2c of the grinding machine with cross hatching. Applicant has amended the preamble of the independent claims to read "grinding machine for grinding a grinding material by means of grinding bodies" in order to eliminate the consecutive use of the word "grinding" which the Examiner deemed confusing.

In view of the foregoing amendments to Figure 2, reconsideration and withdrawal of the objection to the drawings at the top of page 2 of the office action are requested.

In view of the foregoing amendments to the preamble of the independent claims, it is submitted all of the claims now in the application comply with the requirements of 35 USC 112, second paragraph. Therefore, reconsideration and withdrawal of the rejection of claims 1 - 3 and 5 - 27 under 35 USC 112, second paragraph, are requested.

Claims 1 - 3, 5 - 15 and 24 - 27 stand rejected under 35 USC 103(a) as being unpatentable over United States Patent No. 5,823,861 to Kobayashi et al (Kobayashi et al '861) in view of United States Patent No. 4,850,151 to Ditscherlein. Applciants traverse this rejection and request reconsideration thereof.

The present invention relates to a grinding machine for grinding material by means of grinding bodies. The grinding machine includes a stationary container (2)

for receiving grinding material and a rotary disk (3) placed above the container base (2a) for forming a finite gap (5a) with respect to the container wall (2b). In grinding machines of the prior art, a danger exists that the upper and lower parts, particularly the lower part, will be very strongly heated as a result of friction if parts of the grinding material and/or additional added grinding bodies pass during operation into the gap between the container base and the rotating disk. This, on one hand, leads not only to a relatively short grinding machine service life, but, on the other hand, the machine must be frequently switched off during the working of the grinding material to avoid overheating of both the grinding machine and also the grinding and/or polishing material. See, e.g., the fourth paragraph on page 1 of applicant's specification.

According to the present invention, a finite gap is provided between the rotary disk and the container wall, and the rotary disk has a resilient material at least on its underside. According to this construction, if a grinding body or material particle penetrates the gap between the rotary disk and the container wall, the grinding body or material particle is conveyed outwards solely through the rotary movement between the disk and the container base. No wear occurs as a result of the resilience of the disk, or at least its underside, so that the mounting of the disk is not impaired. See, e.g., the third full paragraph on page 2 of applicant's specification.

In the prior art, the gap between the rotary disk and the wall can be chosen to be ever so small, but still material from the container part enters the area underneath the rotary disk. This material collects there, cakes into a solid and, when the rotary disk turns, rubs against it, on the one hand the expenditure of force for turning the rotary disk is increased, on the other hand, heat is disadvantageously formed.

In order to prevent the aforementioned disadvantages and to avoid any abrasive remaining and caking underneath the disk, the present invention calls for the grinding disk to have on its bottom elastic material or to be formed completely from elastic material. This configuration of at least the bottom, when the rotary disk turns, results in vibratory movements of the bottom which prevent the particles which are located there from sticking and allows the particles moreover, to be conveyed to the outside again from the middle (by the vibratory motion and by the centrifugal forces acting on the turning disk at the same time) and ultimately conveyed through the gap between the disk and will again upward into the container space. A dynamic equilibrium is established which prevents more and more grinding material from traveling underneath the disk and caking there into a compact solid.

Kobayashi et al '861 discloses a spiral-flow barrel finishing machine, i.e., a grinding machine with a stationary metallic barrel and a rotating barrel inside the stationary barrel for free rotation therein. However, the Kobayashi et al '861 patent fails to disclose a resilient material on the underside of the rotating barrel, i.e., the rotary disk of the application. With respect to cited Figure 2, Kobayashi et al '861 discloses a rotating barrel 6 comprising a cast-iron rotational barrel 4 equipped with a polyurethane lining layer 5 only at the upper part thereof (column 5, lines 49 - 52). Thus, Kobayashi et al '861 does not disclose a resilient covering at least on the underside of the rotary disk, but rather on the upper side of the rotary disk.

Furthermore, noting in Kobayashi et al '861 would have motivated a person skilled in the art to provide a rotating barrel according to Kobayashi et al with a resilient covering on its underside instead of its upper side. The Kobayashi et al '861 patent is entirely concerned with the problem of avoiding blocking of the clearance S between the stationary barrel 3 and the rotating barrel 6 as a result of thermal

expansion effects of the lining layers 2, 5 of the stationary and the rotating barrel 3, 6, respectively, the lining layers being provided in order to provide protection of both the stationary and the rotating barrels as well as of articles to be ground during operation of the machine.

In contrast to this, the invention proposes a resilient material at least on the underside of the rotary disk in order to prevent crushing of grinding body particles passing beneath the disk and for providing a conveying action that effectively transports grinding body particles passing beneath the disk radially outwards without there being any significant wear to the container base or the rotary disk. This particular problem is not addressed in Kobayashi et al '861 and the particular construction of the rotary barrel 6 with rigid lower portion 4 and resilient upper line 5 is not at all suited to solve the problem underlying the present invention.

Accordingly, the presently claimed invention is neither disclosed nor suggested by Kobayashi et al '861.

While the Examiner acknowledges that the Kobayashi et al '861 patent fails to disclose a rotary disk resilient at least one its underside, the Examiner alleges the patent to Ditscherlein to disclose a rotary base made of polyurethane plastic material and alleges that the polyurethane plastic material is a form of resilient material.

The Ditscherlein patent, while disclosing that the inner surface of the casing, as well as the inside surface of the base, can be formed from a plastic material, for example "polyrethane" (sic.?) does not disclose that the material of the base is resilient and flexible. While some plastics, for example, polyurethane, can have a certain resilience, the material of the base of Ditscherlein is certainly not flexible.

Moreover, the rotary body in Ditscherlein is clearly intended to be solid. That is, despite the use of plastic, the aim is to produce a rigid, solid body. To support

this, Ditscherlein, particularly column 2, last paragraph, indicates the desire to provide gap 9 of set width. With a flexible rotary disk in the Ditscherlein design, in which the outside diameter of the rotary disk is greater than the inside diameter of the wall lining of the stationary container, this would not be possible. It follows from this that the rotary disk of Ditscherlein has to be made rigid and solid.

Hence Ditscherlein does not disclose a rotary disk made of a "flexible" material but in the best case of a hard plastic material, which is not flexible.

Moreover, the Examiner's opinion comes from pure hindsight, which is impermissible. The Examiner does not at all deal with the goal of the invention, namely to allow small grinding bodies, by means of which the objects to be ground may be ground, to reach the gap at the edge of the rotary disk under the rotary disk, and see to it that these grinding bodies are conveyed from this area under the rotary disk to the area above the rotary disk, with the invention providing that the rotary disk is flexible, namely can made actual oscillations.

This idea is not contained in Kobayashi et al '861 or in Ditscherlein, or in any other document. Accordingly, the presently claimed invention is patentable over the proposed combination of Kobayashi et al '861 and Ditscherlein.

Claims 16 - 22 stand rejected under 35 USC 103(a) as being unpatentable over Kobayashi '861 in view of Ditscherlein and further in view of United States Patent No. 5,088,238 to Lin. Applicant traverses this rejection and requests reconsideration thereof.

The Lin patent has been cited by the Examiner in connection with the placement of the drive motor and the use of a gear set. However, even assuming, arguendo, the Examiner's allegations concerning the Lin patent to be correct, clearly nothing in Lin remedies any of the basic deficiencies noted above with respect to

Kobayashi et al '861 and Ditscherlein. Therefore, claims 16 - 22 are patentable over the proposed combination of references.

Claims 23 stands rejected under 35 USC 103(a) as being unpatentable over Kobayashi et al '861 in view of Ditscherlein, and further in view of United States Patent No. 5,476,415 to Nishimura et al and United States Patent No. 5,487,696 to Takemoto et al. Applicant traverses this rejection and requests reconsideration thereof.

The Examiner has cited the Nishimura et al and Takemoto et al patents for their teachings in connection with an outlet provided below a rotary plate disk in the base of a container and a sealable outlet, respectively. However, clearly nothing in Nishimura et al and Takemoto et al remedies any of the basic deficiencies noted above with respect to Kobayashi et al '861 and Ditscherlein. Accordingly, the presently claimed invention is patentable over the proposed combination of references.

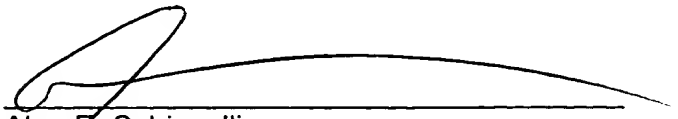
In view of the foregoing amendments and remarks, favorable reconsideration and allowance of all of the claims now in the application are requested.

To the extent necessary, applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to the deposit account of Antonelli,

Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (Case: 321.39341X00), and please credit any excess fees to such deposit account.

Respectfully submitted,

ANTONELLI, TERRY, STOUT & KRAUS, LLP



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Attachments